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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/062,666

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Takashi Hiroi

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EXAMINER

BERMAN, JACK I

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/062,666	Applicant(s) HIROI ET AL.	
	Examiner Jack I. Berman	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,5,6,10-16 and 20-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,5,6,10-16 and 20-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 5, 6, 12-16, and 25-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno (U. S. Patent No. 6,047,083) in view of Worster et al. (U. S. Patent No. 5,963,314). As was explained in previous Office actions, Mizuno discloses a method comprising the steps of: irradiating a charged particle on a surface of a substrate on which a pattern is formed (lines 57-65 in column 3); producing an image of said substrate surface by detecting secondary electrons generated from said substrate as a result of the irradiation (line 66 in column 3 through line 8 in column 4); producing a digital image by subjecting the produced image signal to A/D conversion (lines 37-39 in column 6); comparing the digital image with a reference image and extracting a defect candidate (lines 44-53 in column 3); outputting an actual image of the extracted defect candidate and data comprising the location of the defect candidate, via a storage medium (lines 41-43 in column 6); storing said outputted actual image of the

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extracted defect candidate and data comprising the location of the defect candidate (lines 39-41 in column 6) including data enabling the classification of the defect (lines 53-58 in column 6); and displaying on a screen in a map format the defect candidate location data outputted via either said storage medium or network (lines 35-40 in column 4). As Applicant argued in the Appeal Brief filed on April 10, 2007, Mizuno does not teach to display a selected one of the stored actual images of the extracted defect candidates which is designated on the screen among the extracted defect candidate data displayed in said map format on said screen so that the selected one of the stored actual images is displayed together with said map format on said screen. Such a teaching is found in Worster et al. at line 29 in column 13 through line 44 in column 14 and illustrated in FIG. 4, which discloses a display method for another type of wafer method (using a scanning laser rather than a scanning electron beam) that displays a defect image and a wafer map on the same screen so that an operator can select a stored image of a defect to display by using, for example, a mouse to “point” and “click” on a defect indicated on the wafer map. Since Mizuno teaches, at lines 6-10 in column 7, that stored information can be displayed according to need and that, as is discussed above, both the actual images of defects and a wafer map are stored in a memory, it would have been obvious to a person having ordinary skill in the art to display a selected one of the stored actual images of the extracted defect candidates which is designated on the screen among the extracted defect candidate data displayed in said map format on said screen so that the selected one of the stored actual images is displayed together with said map format on said screen in the manner taught by Worster et al. in order to make use of the point and click system control method disclosed by Worster et al. or to aid an operator in relating the image of a defect to its actual location on the wafer. In this regard, while neither Mizuno nor Worster et al.

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disclose such a feature, it is well known in the art of maps to vary the magnification of maps in order to balance the ability to show a larger area of the geography portrayed by the map, which requires a smaller amount of magnification, and the ability to pinpoint a particular location on that geography, which requires a larger amount of magnification. Such variable magnification in maps is routinely seen in, for example, road atlases which have maps illustrating roads in countries, states, and selected cities. It is rare to find a map online that does not have a zoom feature that allows an operator to select the magnification of the map. It would therefore have been obvious to a person having ordinary skill in the art to display the wafer map produced by the Mizuno apparatus at a selected magnification of a variable magnification, as is claimed in new claims 35-37.

Claims 10, 11, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno and Worster et al. as applied to claims 3, 5, 6, 12-16, and 25-37 above, and further in view of Gallarda et al. (U. S. Patent No. 6,539,106). As was explained in previous Office actions, Gallarda et al discloses the steps of changing threshold value data for detecting defect candidate of said pattern on said screen and displaying on said screen utilizing said changing threshold (i.e. updating the display in accordance with the changing threshold) (column 8, lines 59-60; column 12, lines 37-42), defect candidate matching (column 13, line 56-column 14, line 19), displaying designated classified defect candidate locations in map format on the screen (column 16, lines 60-63), and producing a list or table from among said classified defect candidates so that they are displayed on said screen discriminately from each other in the map format (column 14, lines 58-62).

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Applicant's arguments filed July 29, 2008 have been fully considered but they are not persuasive. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the wafer map is formed based on the defect location data obtained by the same tool or instrument which takes the image of the defect) are not recited in the rejected claim(s). Looking to the same features of independent claims 5, 6 and 16 recited in the arguments:

- outputting an actual image of the extracted defect candidate and data including the location of the defect candidate via either a storage medium or a network;

- storing said outputted actual image of the extracted defect candidate and data including the location of the defect candidate;

- displaying on a screen in a map format, the defect candidate location data outputted via either set storage medium or network; and

- displaying on said screen a selected one of the stored actual images of the extracted defect candidates which is designated on said screen among the extracted defect candidate data displayed in said map format on said screen so that the selected one of the stored actual images is displayed together with said map format on said screen. (emphasis added).

Claim 6 recites the features of:

- outputting an actual image of the detected defect candidate and data including location information of the defect candidate;

- storing said outputted defect candidate actual image and data including location information of the defect candidate in a memory;

- displaying the stored defect candidate on a screen in map format; and

- displaying on said screen a selected one of the actual images of the stored defect candidate stored in said memory which is designated on said screen among the defect candidate data displayed in said map format on said screen so that the selected one of the actual images is displayed together with said map format on said screen. (emphasis added).

Claim 16 recites the features of:

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outputting an actual image of said detected defect candidate and data including location information of the defect candidate while carrying out the step of imaging said substrate and the step of detecting a defect candidate of said pattern;

storing said outputted actual image of said detected defect candidate and data including location information of the defect candidate in a memory; and

simultaneously displaying on a screen, said actual defect candidate image and data including the location information of the defect candidate stored in said memory;

wherein, in the step of simultaneously displaying, said defect candidate data of location information is displayed in a map format on said screen and said actual defect candidate image which is simultaneously displayed on said screen is a selected one of the stored actual images of the detected defect candidates stored in said memory, which is designated on said screen among the defect candidate data displayed in said map format on said screen. (emphasis added).

As can be clearly seen in the plain language of the claims, the wafer map is not formed by assembling images formed by the inspection instrument; instead, it is formed from “data outputted via either set storage medium or network” (using language from claim 5 of the instant application) indicating the layout of the wafer. The defect candidates are not the same thing as the images of the defects; they are actually points to be inspected (in the terminology used by Mizuno. Lines 17-21 in column 7 of Mizuno describe Figures 6A and 6B which illustrate wafer maps displayed by the Mizuno apparatus showing defect candidates (points to be inspected) in Figure 6A and classification of some of the defects found at these locations in Figure 6B. As is discussed above, while Mizuno does not teach to display a selected one of the stored actual images of the extracted defect candidates which is designated on the screen among the extracted defect candidate data displayed in said map format on said screen so that the selected one of the stored actual images is displayed together with said map format on said screen, Worster et al. teaches, at line 29 in column 13 through line 44 in column 14 and illustrated in FIG. 4, to display

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such a simultaneous display of a wafer map and a defect image on the same screen. It would have been obvious to a person having ordinary skill in the art for the reasons already discussed above.

It should also be noted that applicants have misinterpreted Mizuno. On page 14 of the amendment filed on July 29, 2008, applicants state:

Looking to Mizuno, applicants note that as illustrated in Fig. 3 of Mizuno, the wafer map displayed is a map of points to be inspected obtained after an alignment process is performed, by comparing an optical microscopic image of the alignment pattern formed on the wafer with the reference image so that after alignment has been made, the wafer map (a map of points to be inspected) corresponding to the wafer is read out and displayed on the display, as seen in step (6) and as described in column 4, lines 26 - 40 of Mizuno.

Looking at the cited section of Mizuno along with the flow chart of the method illustrated in Fig. 3, it can be seen that the alignment step, which uses an optical microscope, and the step of displaying the wafer map, which is read out from data in the same manner as is done in the instant invention, are two separate steps and the optical microscope is not involved in the formation of the wafer map. Data is not usually "read out" from an optical microscope. It is also worth noting that the instant invention also uses an optical microscope (118), as is set forth at lines 7-9 of the specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (571) 272-2468. The examiner can normally be reached on Monday-Thursday (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jack I. Berman/
Primary Examiner, Art Unit 2881

jb
9/9/08